

6/8/2011

**Federal Communications Commission**  
**Office of Engineering and Technology**  
**Laboratory Division**

**Restrictions on Software Configuration for devices not approved as Software Defined Radios:**

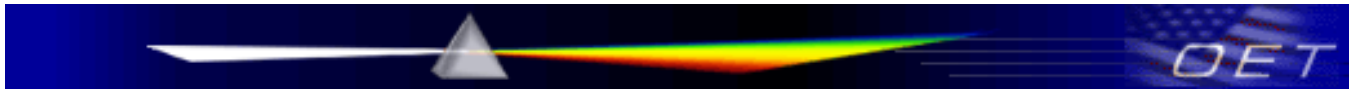
**General Restrictions**

Section 2.931 requires the grantee to ensure that the product as sold continues to comply with the conditions of the grant. For professionally installed equipment, properly authorized installers may adjust the output power so that radiated power is within the grant authorization for the antenna and local installation. However, Section 2.944 (b) requires that any “. . . radio in which the software is designed or expected to be modified by a party other than the manufacturer and would affect the operating parameters of frequency range, modulation type or maximum output power . . . or the circumstances under which the transmitter operates in accordance with Commission rules” must comply with the requirements of Software Defined Radio (SDR). For the purposes of these rules, a third party is anyone except the grantee; such third parties include end users, service providers, operating system providers, application developers, Other or original Equipment Manufacturer(s) (OEM) integrators, professional installers or authorized service dealers. For, any non-SDR device a third party is not permitted to modify the operating parameters of frequency range, modulation type, maximum output power or the circumstance under which the transmitter has been approved. Further, user accessible software download must not enable any such operations and Section 15.15(b) prohibits any user control of parameters. The Commission may allow grantees to permit specific parties, such as operating system providers, service providers or parties under direct control of the grantee to enable software upgrades for field deployed non-SDR devices if the details of such arrangements are provided in a Class II permissive change filing made directly with the Commission. (See KDB 178919 regarding restrictions on permissive changes through software or any exceptions).

If the device certification requires professional installation, installers may be allowed access to certain configuration parameters for adjusting power to accommodate local installation; but only the specific configuration parameters identified in the equipment authorization may be configured on-site. On-site adjustments to the transmitter’s frequency selection parameters, or certain other technical parameters subject to the Commission rules (such as Dynamic Frequency Selection (DFS) for radar detection), using country codes are not permitted.

Certain applications for equipment authorization for non-SDR transmitters that have software configuration control for radio parameters, or other technical parameters as reported to the Commission to ensure compliance must provide a technical description of how such control is implemented to prevent third party modification and to ensure the device only operates within the grant of authorization.. These non-SDR transmitters include those that meet one or more of the following conditions:

- device is capable of operating as a master or client (see below), or



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- device is capable of operating on extended frequencies according to KDB 634817, or
- device has capabilities which will require Class II permissive filing according to KDB 178919 to enable such features.

If such transmitter is approved as a module, the grantee must ensure that the host manufacturer using the module, or any third party software provider, does not have the ability through software to allow for other configuration controls that permit the device to operate outside the conditions of the grant. Filings for such modules must include a technical description of how such controls are implemented. (See KDB 996369).

### **Master and Client Devices:**

Section 15.202 of the rules requires that master devices marketed within the United States must be limited to operation on permissible Part 15 frequencies, and such devices cannot have the ability to be configured by end users or professional installers to operate outside the authorized bands. Selecting country codes or setting other configuration options through software parameters for different regulatory domains is not permitted if the transmitter can be configured, or has the ability to operate with technical parameters outside the FCC regulations in any bands; or if the transmitter has not been approved by FCC certification for such configurations as software defined radio. It is permissible to allow the selection of different regulatory domains, if the regulatory domain(s) selected configures the transmitter to operate only in bands with technical requirements permitted by the rules, and in compliance with the certification as granted.

Any device meeting the definition of a client as specified in Section 15.202 may have the ability to operate on other regulatory domain frequencies if it is under the control of (i.e., automatically associated with) a certified master device<sup>1</sup>. If a device is approved as a master in certain bands and as a client in other bands, the grantee must ensure that there are no software updates or capabilities that will allow the device to operate outside its authorized capabilities in the U.S. for each approved band.

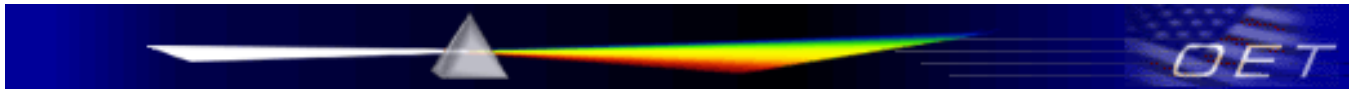
Many devices referred to by the Wi-Fi industry as "client devices" may not meet the definition of a Section 15.202 client, and must be approved as master devices on U.S. authorized frequencies, and must operate in accordance with the grant conditions. To qualify as a Section 15.202 client, a device cannot initiate, or be configured to initiate, any transmission including probes, beacons, or ad-hoc mode transmissions. If a device supports such network initiating functions, it shall be approved as a master device for that particular band<sup>2</sup>. This includes devices that support Wi-Fi Direct modes in the bands where the device is capable of becoming a Group Owner must be approved as master devices under Section 15.202<sup>3</sup>. For devices approved under Section 15.407 subject to the Dynamic Frequency Selection (DFS) requirements, "client devices" capable of initiating such network probes or ad-hoc mode transmissions must have radar detection functionality and must be approved with that capability. .

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<sup>1</sup> A client device is defined in Section 15.202 as "a device operating in a mode in which the transmissions of the device are under control of the master. A device in client mode is not able to initiate a network."

<sup>2</sup> Such devices may still be referred to as "Wi-Fi" clients.

<sup>3</sup> Wi-Fi Direct is specified by Wi-Fi Alliance to enable direct device to device communications. See [http://www.wi-fi.org/Wi-Fi\\_Direct.php](http://www.wi-fi.org/Wi-Fi_Direct.php).



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### Change Notice

**02/24/2011** Publication: 594280 were changed on 02/24/2011. Prior to this change this publication did not contain any attachments. This change moved the general guidance on Restrictions on Software Configuration for devices not approved as Software Defined Radios into an attachment. In addition, guidance was added regarding restrictions on permissive changes through software exceptions referencing KDB 178919 Permissive changes.

**06/08/2011** Publication: 594280 D01 Software Configuration Control v01 has been changed to 594280 D01 Software Configuration Control v01r01 for clarification for applications for equipment authorization for non-SDR transmitters has been added.

